In the Claims:

Please cancel claims 1 through 72 without any disclaimer and a prejudice to and add the following new claims.

73. A method for manufacturing a liquid crystal display device, comprising:

depositing a liquid crystal and pre-polymer mixture onto an inner surface of a first substrate and an inner surface of a second substrate, the liquid crystal and pre-polymer mixture comprising polymer initializing and/or enhancing (PIE) elements, wherein the first substrate and the second substrate are made of a flexible polymer material; and

laminating together the first substrate and the second substrate to form a liquid crystal cell,

wherein at least one of a polymer support extending between the first substrate and the second substrate and a non-structural PIE element extending at least about one-quarter of a distance between the first substrate and the second substrate is formed via polymerization in situ in response to the PIE elements.

74. The method of claim 73, further comprising depositing spacers onto at least one of a first substrate and a second substrate, the spacers being distributed generally randomly along an inner surface of at least one of the first substrate and the second substrate, wherein at least a portion of the spacers substantially extending the distance between the first substrate and the second substrate.

75. The method of claim 74, wherein the PIE elements are added to the liquid crystal and pre-polymer mixture such that the PIE elements have a cross-sectional density which is about two-times a cross-sectional density of the spacers.

76. The method of claim 73, wherein the PIE elements comprise at least one of a structural PIE element (SPIE) and a non-structural PIE element (NSPIE), wherein the SPIE element and the NSPIE element increases a peel strength and a compressive strength of at least

one of the first substrate and the second substrate and materials within the liquid crystal cell.

77. The method of claim 76, wherein the NSPIE element is in contact with one of the first substrate and the second substrate.

78. The method of claim 76, wherein the NSPIE element is not in contact with the first substrate and the second substrate.

79. The method of claim 76, wherein the SPIE element is in contact with the first substrate and the second substrate.

80. The method of claim 76, wherein the NSPIE element comprises at least one of glass and plastic and has a shape of at least one of a sphere and rod.

81. The method of claim 76, wherein the NSPIE element has a non-smooth surface.

82. The method of claim 76, wherein the NSPIE element is made of nanporous material.

83. The method of claim 74, wherein the PIE elements comprise at least one of an accelerant and an initiator of the in situ polymerization process.

84. The method of claim 83, wherein the initiator is at least one of a photoinitiator and an accelerator lacquer initiator.

85. The method of claim 83, wherein:

if photoinitiators are used, the method further comprises initiating polymerization by exposing a first side of the liquid crystal cell and a second side of the liquid crystal cell to ultraviolet light causing scission of the photoinitiator and release of free radicals around the spacers coated with the photoinitiator, and

if the accelerator lacquer initiator is used, polymerization is automatically initiated by the accelerator lacquer initiators after the liquid crystal and pre-polymer mixture is brought into contact with the accelerator lacquer such that polymerization will proceed beginning around each spacer coated with the photoinitiator and/or the accelerator lacquer initiator.

86. The method of claim 84, wherein a concentration of the accelerant and/or the initiator is about 0.1 to about 0.5% of the pre-polymer in the liquid crystal cell.

87. The method of claim 83, wherein the PIE element comprises at least one of adhesion promoters and additives for improving elongation.

88. The method claim 87, wherein the adhesion promoter is a silane.

89. The method of claim 88, wherein the adhesion promoter is methacrylate silane.

90. The method of claim 83, wherein the accelerant is a tertiary amine.

91. The method of claim 85, wherein the in situ polymerization results in an acrylic adhesive.

92. The method of claim 85, wherein the in situ polymerization results in at least one of an epoxy and an urethane.

93. The method of claim 73, further comprising coating, with a vapor barrier, an outside surface of the first substrate and an outside surface of the second substrate.

94. The method of claim 93, further comprising coating a layer of a transparent conductor on the first substrate and the second substrate, wherein the transparent conductor is patterned via at least one of chemical beam etching, electron beam etching and laser etching.

95. The method of claim 94, further comprising:

coating, with a polyimide solution, at least one of the first substrate and the second substrate coated with the transparent conductor; and

baking at least one of the first substrate and the second substrate to form a polyimide surface on thereon.

96. The method of claim 95, wherein the step of baking comprises baking the first substrate and the second substrate are baked for about one hour at a temperature of about 150°C.

97. The method of claim 94, further comprising rubbing the polyimide surface to develop an alignment layer for the liquid crystal cell.

98. The method of claim 74, further comprising surface etching glass spacers to create the spacers having PIE material on or therein.

99. The method of claim 98, wherein the step of surface etching glass spacers comprises surface etching glass spacers having a diameter of about 3 to about 3.5 μm.

100. The method of claim 98, wherein the step of surface etching comprises using about a 1.25% solution of hydrofluoric acid for about 10 minutes while suspended in a solution in an ultrasonic vibration tank.

101. The method of claim 98, further comprising coating, after washing, the etched spacers with a mixture of an adhesion promoter and at least one of the photoinitiator and the accelerator lacquer initiator by immersing the etched spacers into a solution containing the adhesion promoter and at least one of the photoinitiator, the accelerator initiator and an accelerant.

102. The method claim 101, wherein the adhesion promoter is a silane.

103. The method of claim 102, wherein the adhesion promoter is methacrylate silane.

104. The method of claim 101, wherein the accelerant is a tertiary amine.

105. The method of claim 104, wherein the tertiary amine is dimethyl amino benzene.

106. The method of claim 74, wherein the spacers comprise porous plastic and the PIE material is absorbed into the pores of the plastic.

107. The method of claim 74, wherein the spacers comprise high-surface area particles that are nanporous, mesoporous, or microporous.

108. The method of claim 74, wherein the spacers are at least one of dry sprayed and wet sprayed onto at least one of the first substrate and the second substrate.

109. The method of claim 73, wherein the step of depositing comprises depositing spacers with a density of at least about 30 spacers/mm^2.

110. The method of claim 73, wherein the step of depositing a liquid crystal and pre-polymer mixture comprises depositing a liquid crystal and pre-polymer mixture comprising of about 10% photoinitiator and/or accelerator lacquer initiator pre-polymer and about 90% liquid crystal material.

111. The method of claim 110, wherein the liquid crystal and pre-polymer mixture comprises about 10% pre-polymer material and about 90% liquid crystal material.

112. The method of claim 73, wherein the flexible polymer material of the first substrate and the second substrate is polyethersulphone.

113. The method of claim 73, wherein the substrate has a glass transition temperature

greater than 150°C.

114. The method of claim 73, wherein the step of laminating together the first substrate and the second substrate to form a liquid crystal cell is performed at about room temperature.

115. The method of claim 73, wherein the pre-polymer of the liquid crystal and pre-polymer mixture comprises aromatic amines and the spacers comprise an accelerator lacquer initiator comprising peroxide and the method further comprises selecting a combination of the pre-polymer and accelerator lacquer initiator to control a rate of free radical generation rate, which when combined with the diffusion rates of the pre-polymer and liquid crystal and spacings within a display region, result in the polymerization beginning in a region surrounding the spacers.

116. The method of claim 73, further comprising, after initiation of polymerization and before completion thereof, adjusting a rate of diffusion of the mixture of the pre-polymer and the liquid crystal material by at least one of adjusting reaction temperature and adjusting a viscosity of the mixture of the pre-polymer and the liquid crystal material to produce variation.

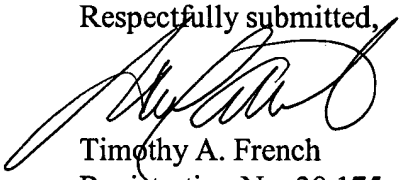
117. The method of claim 116, wherein the step of adjusting comprises adjusting the reaction temperature to 45°C or more.

118. The method of claim 116, wherein the step of adjusting comprises adjusting the viscosity of the mixture of the pre-polymer and the liquid crystal material to be 1000 cps or less.

Conclusion

It is respectfully requested that this amendment be entered prior to the examination of the above-referenced patent application. It is believed that no new matter is added by this amendment. By this amendment, claims 73-118 are now pending, among which claim 73 is an independent claim. If the Examiner desires any additional information, the Examiner is invited to contact Applicants' attorney at the telephone number listed below to expedite prosecution.

Respectfully submitted,



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